Václav Pavlíček

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Education

Imperial College London – PhD Electrical and Electronic Research 2024–2028

- **Project:** Unlimited Sampling and Noise-Shaping Beyond Fourier Domain: Theory, Hardware and Applications
- **Supervisor:** Dr Ayush Bhandari
- **Teaching Assistant:** Computational Sensing and Imaging; Communications; Digital Signal Processing and Digital Filters; Programming for Engineers

Imperial College London – MEng Electronic and Information Engineering 2020–2024

- **Selected modules**: Adaptive Signal Processing; Communications; Control Systems; Deep Learning; Digital Signal Processing, Discrete Mathematics; Mathematics for Engineers; Mathematics for ML; Operations Research; Real-Time DSP; Signals and Systems; Statistical Signal Processing and Inference; Wavelets; Wireless Communications and Optimization; Topics in Large Dimensional Data Processing
- **Teaching Assistant:** Communications; Programming for Engineers
- **Grades:** Year 1 – First Class with Honours (72.95 %); Year 2 – First Class with Honours (75.80 %, **Dean's List**) and Year 3 – First Class with Honours (79.33 %, **Dean's List**); Year 4 – First Class with Honours (79.60 %)
- **Overall Grade:** First Class with Honours (78.67 %)

SPŠE a VOŠ Pardubice – Maturita certificate (Czech Republic) 2016–2020

- Czech and literature (1), Mathematics (1), Physics (1), Hardware (1), Maturita project (1), Web applications (1) (1 – best grade possible)

Awards and Prizes

- IEEE Signal Processing Society Scholarship 2025
- EPSRC PhD Scholarship 2024 – 2028
- Ivor Tupper Prize for Excellence in signal processing, broadcasting and video technology 2024
- Heidelberg Laureate Forum Young Researcher 2024
- IEEE SPS Travel Grant for SPAWC 2024
- EUSIPCO 2024 Student Travel Grant
- Imperial College Trust Conference Grant 2024
- 1st place at IEEE ACDS Imperial Conference 2023
- Dean's List for Academic Excellence in 2022 and 2023
- Head of Department's Prize for the Best Second Year Group Project 2022
- Head of Department's Prize for the Best First Year Group Project 2021
- Bakala Foundation Scholarship for Undergraduate Studies 2020 – 2024
- Czech High School Student of the year 2020 – 3rd place
- ESA Astro Pi Challenge 2019-20 Finalist – TOP 10 of all 545 international teams
- ESA CanSat International Competition 2019 – Best Outreach Award and Award for the Final Report

Publications and Demos

- **V. Pavlíček**, R. Guo, and A. Bhandari, "Unlimited Sensing of Sinusoidal Plane Waves," in *European Sig. Proc. Conf. (EUSIPCO), under review*. IEEE, Aug. 2026.
- **V. Pavlíček**, R. Guo, and A. Bhandari, "Towards Event-Driven Radars: Spectral Super-Resolution and Hardware," in *IEEE Intl. Conf. on Acoustics, Speech and Signal Processing (ICASSP), in press*, May 2026.
- **V. Pavlíček** and A. Bhandari, "Hand Gesture Recognition with USF- Radar," in *Show & Tell Demo, IEEE Intl. Conf. on Acoustics, Speech and Signal Processing (ICASSP), in press*, May 2026.

- R. Guo, **V. Pavlíček**, and A. Bhandari, “Enhancing Doppler and FMCW Radars via Unlimited Sensing,” in *IEEE Intl. Conf. on Acoustics, Speech and Signal Processing (ICASSP), in press*. IEEE, May 2026.
- R. Guo, **V. Pavlíček**, and A. Bhandari, “Unlimited Sensing Radar: Enhancing Resolution via Modulo ADCs,” in *Show & Tell Demo, IEEE Intl. Conf. on Acoustics, Speech and Signal Processing (ICASSP), in press*, May 2026
- **V. Pavlíček** and A. Bhandari, “Gesture Recognition with USF-Radars: Modulo Pre-Processing Enhances Classification,” in *IEEE Radar Conference (RadarConf25). IEEE*, Oct. 2025, pp. 1–6.
- **V. Pavlíček** and A. Bhandari, “1-Bit Unlimited Sampling Beyond Fourier Domain: Low-Resolution Sampling of Quantization Noise,” *IEEE J. Sel. Topics Signal Process.*, vol. 19, no. 6, pp. 1133–1145, Sep. 2025.
- **V. Pavlíček**, R. Guo, and A. Bhandari, “Bits, Channels, Frequencies and Unlimited Sensing: Pushing the Limits of Sub-Nyquist Prony,” in European Sig. Proc. Conf. (EUSIPCO). IEEE, Aug. 2024, pp. 2462–2466.
- **V. Pavlíček** and A. Bhandari, “Sparse Sampling in Fractional Fourier Domain: Recovery Guarantees and Cramér–Rao Bounds,” *IEEE Signal Process. Lett.*, vol. 31, pp. 1665–1669, 2024.

Work and research experience

Imperial College London – Research placement student April – September 2023

- Worked under the supervision of Dr Ayush Bhandari on the Unlimited Sampling Framework (USF).
- Investigated ideas from the published literature and implemented algorithms in **MATLAB**.

ESA – European Space Operations Centre – Student intern June – September 2022

- Developed a validator for INTEGRAL satellite schedule in **Python**.
- Implemented tool in **Python** used to determine transponder swap times for INTEGRAL satellite.
- Used **Git** to collaborate with others and **pytest** to develop both tools using test-driven development approach.

Institute of Physics of the Czech Academy of Sciences – Student intern 2019–2020 and 2021

- Developed **LabVIEW** programs for silicon sensors testing.
- Implemented a system for storing measurements data in **PHP** and **MySQL** running on **Docker** environment.
- Cooperated with other students on the automation of lab monitoring sensors using **Linux Shell** and **Python**.
- Received 4th place in a national round of the High school professional activity competition in Physics.

Commity – Software developer 2017–2019 and 2020

- Implemented Word export service for survey generator app in **Kotlin** and automated Word file testing.
- Independently configured **Docker** environment for automated testing environment.
- Remotely collaborated on the development of web client view of the application using **JavaScript** and **Git**.

Volunteering

IMS2025 Radar Tracking Challenge – Engineer 2024-2026

- Conducted a feasibility study of the use of a TI radar unit for Dr Václav Valenta.
- Developed **MATLAB** and **Python** scripts to process TI radar data from outdoor trials.

Imperial College Math School – Research project supervisor 2025-2026

- Supervised a team of 4 high-schoolers working on ”The impact of Digitisation on Radar Signals and Systems”.

Imperial Czech and Slovak Society – Committee member 2021-2025

- Organized social and networking events for Czech and Slovak students at Imperial.

GUG.cz – Event organizer 2017-2020

- Organized a variety of IT-related events and conferences for the general public.

SHM Krucemburk – Event organizer 2016-2023

- Regularly organized events and summer camps for children from the local community.